City of Happy Valley

ENGINEERING DIVISION

ENGINEERING DESIGN

AND

STANDARD DETAILS

MANUAL

Adopted: March 6, 2007

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INTRODUCTION

1. Purpose

The City of Happy Valley's *Engineering Design Manual* has been developed to provide a uniform set of standards and procedures to assist the City and private consulting engineers in coordinating, designing and constructing public improvement projects. These standards apply to all improvements within the existing and proposed public right-of-way and easements, to all improvements intended for maintenance by the City, and to all other improvements for which the City of Happy Valley *Municipal Code* requires the approval of the City Engineer. Standards for site grading, erosion control, pedestrian and bike facilities, parking lots, and driveway construction on private property are also contained in this manual and referenced in the *Municipal Code*. Changes or corrections to the *Engineering Design Manual* will be made by the City Engineer as needed.

2. Adopted Standards and Reference Manuals

The City has adopted the APWA/ODOT *Oregon Standard Specifications for Construction*, latest edition, the AASHTO *A Policy on Geometric Design of Highways and Streets*, latest edition, and the *Manual on Uniform Traffic Control Devices* (MUTCD), latest edition for street design and construction standards. The City has also adopted Clackamas County Water Environment Services (WES) *Stormwater Management Design Standards and Sanitary Sewer Standards* for the design and construction of the stormwater facilities and sanitary sewer systems. These standards will be used in the design and construction of improvements within the City of Happy Valley.

The City's *Transportation System Plan (TSP)*, latest edition, shall be used to plan the transportation system development in Happy Valley.

3. Service Providers

CCSD #1 – Clackamas County Service District #1, Water Environment Services (WES): Sanitary Sewer and Storm Sewer service provider.

CCSD #5 – Clackamas County Service District #5: Street Lighting service provider.

CCFD #1 – Clackamas County Fire District #1.

DEQ – Oregon Department of Environmental Quality.

Sunrise Water Authority - Drinking Water service provider.

Clackamas River Water - Drinking Water service provider.

CHAPTER 1
DEVELOPMENT PROCESS

1. General

Property owners, developers and others proposing to do any work on a site that will alter the site to a significant degree, will be required to obtain all applicable land use approvals and permits. No work may begin on a site prior to the approval of construction plans and issuance of appropriate permits from all agencies involved. Construction plans shall be designed and stamped by a professional engineer, registered in the State of Oregon, herein after referred to as the Design Engineer.

2. Preliminary Engineering

a. Pre-application Conference - At the start of the development process, the developer shall attend a pre-application conference for all development proposals that require land use approvals and for most commercial building improvements. The purpose of the pre-application conference is to help the applicant through the land use and permit process.

b. Providing for Future Development - All improvements shall be designed as a logical part of the development of the surrounding area. Storm sewers and sanitary sewers shall be sized to accommodate the entire drainage basin which they will ultimately serve. Utilities and street improvements will be extended to the boundaries of the development for future extensions to the adjoining areas. The City Engineer may require oversizing of utilities to accommodate future growth of the City.

Where existing utility lines do not adjoin the proposed development, the developer will be required to extend the lines to the development as necessary. Where existing roadway improvements do not extend to the proposed development, the developer will be required to improve the roadway to the development as necessary.

c. Pavement Moratorium - There is a moratorium on any City street that has been recently paved. No street cuts will be allowed in an arterial or collector street that has been paved or resurfaced within the previous five (5) years, or any other street that has been

paved or resurfaced within the previous three (3) years. Exceptions may be made by the City Engineer on a case by case basis. Exceptions will require special pavement section restoration limits, and/or grinding and repaving of the entire street section.

d. Utilities - All utility improvements associated with the development, including telephone, internet, electrical power and lighting, gas, and cable TV, shall be installed underground in the public utility easement, and shall meet the current standards of the appropriate agency as well as City standards. See *Chapter 2, Section 4* for additional information.

3. Construction Plan Review

Submit two full size construction plan sets and the Plan Review Deposit to the Engineering Division for initial review after obtaining land use approval. Supporting information and documentation, such as a geotechnical engineering report, wall designs and traffic studies shall be submitted as well. Plan review priority will be given to plans submitted for final review over plans submitted for initial or intermediate review.

Upon completion of the detailed review by the City, one set of plans with "redline" comments will be returned to the Design Engineer. More than one review may be required. All successive sets of "redline" plans shall be returned to the City with the corresponding revised plan set. After the Design Engineer has completed all revisions and obtained the necessary permits from affected Service Providers (ie, Sunrise Water Authority, Water Environment Services, DEQ, Clackamas County DTD), one full size set and three half-size sets of final revised drawings shall be submitted to the City for signed approval. Additionally, a CD containing scanned electronic files of the final approved and signed drawings (in PDF) shall be submitted to the City prior to commencing construction.

The final plan review and approval is valid for one (1) year from the date of plan review fee payment and submittal of the Site Development Permit. Extensions to the permit can be made by requesting a one year extension. Approval of the permit extension may require a new plan review if conditions have changed since the plans were approved. See *Chapter 2, Section 9* for more information about the permits that must be obtained prior to beginning construction.

4. Construction Plan Review and Inspection Fees

Construction Plan Review and Inspection Fees are based upon the construction value of the project. A Plan Review Deposit must be submitted at the time of the first plan review submittal. The most recent fee schedule is available on the City's website at www.happyvalleyor.gov.

5. Performance and Maintenance Guarantees

Prior to construction plan approval, the developer shall submit a financial guarantee for the improvements as required in *Section 16.50.080* of the City's *Municipal Code*. Upon satisfactory completion of the required public improvements, a two-year 25% maintenance guarantee shall be submitted.

6. Pre-construction Meeting

The construction plans will be approved by the City and Water Environment Services at the project pre-construction meeting. The developer's Design Engineer is responsible for arranging the pre-construction meeting between principal representatives of the engineer, contractor, developer, City, and Water Environment Services in the City offices.

The Construction Plan Review and Inspection Fees, financial guarantee and a Certificate of Insurance naming the City as additional insured shall be submitted at or prior to the pre-construction meeting.

7. Project Acceptance

a. Submittals

Following completion of construction and prior to final inspection of a completed project, the Design Engineer shall submit a complete set of as-built (record) drawings for review. As-built drawings shall contain and reflect all design modifications incorporated into the completed project and all revisions to the previously approved construction plans. The as-built plans shall include all easements shown on the final recorded plat.

Once the as-built plans have been reviewed and accepted by the City and Water Environment Services, photographically reproducible as-built mylars shall be submitted. Each sheet of the as-built drawings shall be stamped “As-Built”, and shall be dated and signed by the Design Engineer. Sepia mylars or vellums will not be accepted. A CD shall also be submitted containing electronic files in PDF and CADD format of the scanned signed as-built drawings.

If specialists were required in the design of the project (geotechnical engineer, structural engineer, surveyor, arborist, wetland scientist, etc.) then a certificate of completion letter from those individuals shall be required relating to their specialty.

Individual lot as-built drawings shall also be submitted at project closeout. Each individual lot as-built shall include the following:

- all easement restrictions on the lot
- sanitary sewer lateral with pipe size, ties to the end of the lateral, pipe depth and length
- storm sewer lateral with ties to the end of the lateral, pipe depth and length

b. Project Punchlist

A punchlist will be prepared for the project outlining the items that need to be completed prior to project acceptance and submittal of building permits. The punchlist will include field items, as-built plan review items, bonding requirements and approvals from the City’s Service Providers.

c. Building Permit Release Letter

A Building Permit Release Letter is issued when the public improvements for a development have been completed and the project has been accepted by the City. Builders can submit for building permits once the Building Permit Release Letter has been signed by City and Water Environment Services staff.

CHAPTER 2
GENERAL DESIGN INFORMATION

1. General

Review of the public improvement plans is initiated by the submittal of construction plans that are at least 95% complete. Public improvement plans shall be designed and stamped by a professional engineer, registered in the State of Oregon, herein after referred to as the Design Engineer. Submit two full size construction plan sets to the City Engineer for initial review. Supporting information and documentation, such as a geotechnical engineering report, wall designs and traffic studies shall be submitted as well. Plan review priority will be given to plans submitted for final review over plans submitted for initial or intermediate review.

Upon completion of the detailed review by the City, one set of plans with "redline" comments will be returned to the Design Engineer. More than one review may be required. All successive sets of "redline" plans shall be returned to the City with the corresponding revised plan set.

2. Construction Drawing Requirements

a. Drawing Format

Plans shall be submitted on 22" x 34" sheets.

A vicinity map is to be located on the first sheet of all plans and shall show the location of the project with respect to the nearest major street intersection.

A north arrow shall be shown on each plan view sheet and adjacent to any other drawing which is not oriented the same as other drawings on the sheet. The preferred orientation of the north arrow is up or to the right on the plan sheet, with stationing from left to right.

The scale shall be 1”= 2’, 4’, 5’ or 10’ vertically and 1”= 10’, 20’, 30’, 40’ or 50’ horizontally for all drawings except structural drawings. The scale of corresponding sheets shall be the same.

Letter size shall not be smaller than 0.10 of an inch high.

All detail drawings, including standard drawings, shall be included in the drawings.

A note about the required Construction Hours Notice Sign shall be included in the Construction Notes for each project. See the *City’s Standard Drawing 350* for more information.

The location and elevation of a National Geodetic Survey, United States Geological Survey, Clackamas County or City of Happy Valley benchmark shall be shown. Temporary benchmarks shall be shown or referenced on the plans.

A title block shall appear on each sheet of the plan set and shall be placed across the bottom edge of the sheet, or across the right-hand edge of the sheet. The title block shall include the name of the project, the City land use file number, the Developer/Applicant’s name, the engineering firm, the sheet title and number.

The seal of the Registered Professional Engineer responsible for preparation of the plans shall appear on each sheet.

The seal of the Registered Landscape Architect responsible for the preparation of the landscape plans shall appear on each applicable sheet.

b. Plan Organization

The following plan sheets shall be included in the Construction Drawings:

Title Sheet - include the project name in large letters across the top of the sheet, vicinity map, General Notes, notice to excavators for One Call Utility Locates, sheet legend/index, and space for the City approval stamp (3”x5) in the lower right quadrant.

Standard General Notes shall be obtained from the City and shall be faithfully reproduced on the title sheet or separate general notes sheet.

Composite Utility Plan - include existing public and private utilities, proposed public and private utilities, and proposed public improvements.

Sanitary Sewer, Storm Sewer and Water Plan and Profile - show existing and proposed finished contours, and include all piping, structures and appurtenances as required by Water Environment Services, Sunrise Water Authority and Clackamas River Water District.

Street Plan and Profile – Provide a stand-alone street plan and profile, not combined with any other utility. Show existing and proposed finished contours. Street lighting, signing and striping plans shall be on a separate sheet to provide clarity.

Grading and Erosion Control Plan - use 2-foot contour intervals. See *Section 4* in this chapter for additional requirements.

Tree Removal Plan - include all plan elements required by the Tree Removal Permit application.

Landscape Plan – a street tree and planter strip landscape plan shall be included in the construction plan set in accordance with *Municipal Code Section 16.42.040*. All landscape plans shall include public utility easements, other easements, sight vision zones, sidewalks, bike and/or pedestrian pathways, entry monuments or signage, retaining walls, irrigation, underground utilities, street signs and street lights along all existing and proposed street frontages.

Signage and Striping Plan – provide a signage and striping plan for review.

City Standard Drawings - shall be full size or 75% of original size.

c. Plan View

Plan views shall show the following within the site and for a minimum of 200 feet around the perimeter of the site unless specified otherwise:

i. Right-of-way, property, tract, and easement lines (existing and proposed) and their respective identifiers, and existing and proposed utility lines within them, all on the same drawing.

ii. Subdivision name, lot numbers, street names, and other identifying labels. Subdivision and street names are subject to the approval of the City Planning Division, Fire Marshal's Office, and the County Surveyor.

iii. Location and stationing of existing and proposed street center lines and curb faces.

iv. Horizontal alignment and curve data of proposed street center lines and curb returns.

v. Existing aboveground and underground utility facilities and vegetation within the construction limits. For additional information required on Site Grading Plan, see *Chapter 2, Section 4*.

vi. Location of existing buildings, wells, septic tanks, drain fields, fuel tanks, and any other buried structures. An ALTA survey shall be required for at least 100 feet surrounding any of the above items to remain. Historical buildings shall be identified as such on the drawings.

vii. All other affected, adjacent and existing off-site areas and features that are within a distance of 200 feet outside the site boundary, including but not limited to:

- Off-site features that, in the Design Engineer's best judgment, will be within the zone where the construction activities have the potential to impact or potentially compromise the off-site feature. Such construction activities include, but are not limited to; grading, excavation, fill construction, trenching, stockpiling, pile driving, blasting (blasting requires a special permit), ground shaking from construction vehicles or equipment, and structural loading. Off-site features include, but are not limited to; vegetation, landscaping and trees, buildings, fences, decks, walls, slabs and pavements.
- Trees of any type that are 6-inches diameter at breast height (DBH) or more, and whose root zones extend into the site using the trees' canopy as the delineator of the root zone, or are within 10 or less of the site boundary.
- Other features or areas designated by the City Engineer for evaluation.

- Tax lot information for subject site and adjacent properties including; tax lot number, lot area, and Township, Range and Section Numbers.

viii. Location, stationing and size of all proposed mains and service lines for storm drainage, sanitary sewer, and water. Stationing shall be located in relationship to the street stationing at all manholes or other key locations.

ix. Match lines with stationing and sheet number references.

x. Street centerline stationing to be noted at a minimum of 100 foot intervals and "tic" marks at 50 foot intervals.

xi. Top of curb elevations along curb returns at quarter-deltas, and at 100 foot stations.

xii. Location of the low points of street grades and curb returns, and the locations of catch basins and street inlets.

xiii. Sidewalk dimensions and locations and sidewalk ramp dimensions and elevations. This shall include spot elevation at breaks in grade on ramps, locations by street stationing of transitions in locations or width, and dimensions and street stationing for driveways.

xiv. Crown lines along portions of streets, transitioning from one typical section to another.

xv. Center line stationing of all intersecting streets.

xvi. Location and description of existing survey monuments, including but not limited to section corners, quarter section corners, donation land claims corners, and Clackamas County bench marks.

xvii. Location of proposed street intersection monument boxes and other required surveying monuments shown on the plat.

xviii. FEMA designated 100-year flood plains and flood ways, or areas of flooding during a 100-year storm event, wetland buffers and natural resource areas.

xix. Existing and proposed wetland areas, wetland mitigation areas, and storm water quality undisturbed corridors (buffer strips), drainage ways and swales.

xx. Legend.

xxi. Any additional information that the City, Water Environment Services (WES), Clackamas County Department of Transportation and Development (DTD), Clackamas County Service District #1 (Street Lighting), Clackamas County Fire District #1, Sunrise Water Authority, or Clackamas River Water deem necessary.

d. Profile View

Profile views shall show the following:

i. Stationing, elevations, vertical curve data (including curve k factors), and slopes for center of streets or gutterline. For off-set or super-elevation cross-sections, both curbs shall be profiled. Where curbs are not to be constructed, centerline of street and ditch inverts shall be shown.
ii. Original ground along the centerline, and if necessary, at the edges of the right-of-way if grade differences are significant.
iii. Centerline, top of curb, and gutter flow lines of existing streets for a distance of at least 200 feet each way at intersections with proposed streets. For stub streets that may be extended in the future, the vertical alignment shall be designed for at least 200 feet beyond the scope of the proposed construction. At the discretion of the City Engineer, additional design information concerning the vertical and horizontal alignment of future street extensions may be required.
iv. The gutterline for all cul-de-sacs, eyebrows and reflecting quarter deltas, low and high points, vertical curve data, and extending 50 feet beyond the PC and PT.
v. All proposed drainage facilities, all invert and top elevations, slopes, materials, bedding, and backfill.
vi. Existing drainage facilities, including off-site facilities, upstream and downstream that affect the design (i.e., downstream restrictions that back water on to project site). Base flood elevations shall be shown on the profile, if applicable.
vii. Profiles for ditch and creek flowlines shall extend a minimum of 200 feet beyond the project, both upstream and downstream. Typical cross sections at 50 foot intervals shall also be submitted.
viii. Profiles for existing and proposed storm, sanitary, and water mains.
ix. All existing and proposed sanitary, water, storm lines and other utilities crossing the profile.

e. Pathways

A separate plan and profile view shall be provided for each pedestrian pathway or multi-use trail. Pedestrian pathways and multi-use trails shall be designed in accordance with the City's *Trail Development Handbook*.

f. Curb Returns

Each curb return shall be individually designed and shall include a profile and plan view. See *Chapter 3, Section 11* for more information.

3. Site Grading

a. Site Grading Plan

A Site Grading Plan is required for any project that involves moving 1000 cubic yards or more of material. Existing and proposed grading contours shall be shown at 2-foot intervals, and shall extend a minimum of 200 feet off-site. The grading plan shall be prepared from recent ground surveys, and shall show all existing and proposed surface drainage conveyances, storm drainage collection structures, and all storm drainage outfalls. The grading plan shall note the source of the survey information, date of the field work, and the location of the original survey documents.

The limits of the proposed grading shall be clearly delineated on the grading plan. The grading plan shall require the installation of orange construction fencing at the grading limits. The grading plan shall be designed in conformance with the *Municipal Code Section 16.42.050 – Tree cutting and preservation*.

Setbacks from the development property line for the top of a cut slope or the toe of a fill slope shall be in accordance with *Municipal Code Section 15.12.100 - Setbacks.* Grading plans for areas where grading will be within 10 feet or less of the property line shall include cross sections every 50 feet, with a minimum of three cross sections. These cross sections shall extend a minimum of 50 feet each side of the property line and shall show proposed and existing grades, structures and utility facilities.

b. Erosion and Sediment Control Plan

An Erosion and Sediment Control (ESC) Plan is required for all projects that require a Site Grading Plan. The ESC Plan shall have all information noted in the previous section for the Site Grading Plan, as well as ESC measures for all necessary phases of construction. The City of Happy Valley has adopted the use of the latest *Erosion Prevention and*

Sediment Control Manual from Clackamas County, Water Environment Services (WES) for assistance in determining the best management practices (BMP's) for the site.

The goal of the ESC Plan is to keep all sediment on the site. Preserving the natural vegetation as an erosion control method in addition to other BMP's is encouraged. Vegetated cover shall be maintained on slopes and/or reinforced through new plantings for stability and erosion control purposes. Vegetation shall not be stripped from any area outside of the grading limits.

The ESC Plan shall include all construction drawing information required by the Oregon Department of Environmental Quality (DEQ) NPDES 1200C permit. A site specific drainage plan for the temporary collection and treatment of surface water and ground water during the construction phase shall be included in the ESC plan.

c. Tree Cutting and Preservation

Provide a Tree Removal and Protection Plan in accordance with *Municipal Code Section 16.42.050 – Tree cutting and preservation*. The purpose of this code is to regulate the removal and preservation of trees, to protect trees as a natural resource of the City, and to allow the prudent management of trees by individual property owners and developers. A Type B Application is required when trees are to be removed in conjunction with a subdivision, PUD, land partition or nonresidential construction project.

Attention is called to the tree survey requirements noted in *Municipal Code Subsection 16.42.050.D.2.a.* The tree survey is to be prepared by a certified arborist, or other qualified landscape specialist as approved by the City. The tree survey shall describe the size, species, health and condition of the trees on-site and shall include a map that locates trees on the property. Drainageways, wetlands and surface water features shall also be identified on the map.

The Tree Removal and Protection Plan shall identify each tree to be removed, protective fencing around trees or vegetation to be protected, and shall map proposed mitigation and erosion control measures. The plan shall also include the existing and proposed grades on the site.

d. Geotechnical Report

Many development sites in Happy Valley are on slopes, therefore a Geotechnical Report by a licensed registered engineer shall be included with the initial submittal of the construction plans. The Geotechnical Report shall include and make recommendations on the following items:

- Statement of understanding about the site development proposal.
- Site Preparation – clearing of vegetation and organic debris, removal of existing subsurface structures, depth of over-excavation, and critical points where inspection by the geotechnical engineer is required.
- Engineered Fills, Grading and Slope Steepness– preparation of existing ground prior to placing fill, benching and fill slope keyway requirements, sub-drain installations, compaction requirements for engineered fills, suitable fill materials, lift thickness, moisture content, finish fill and cut slope steepness, finishing of slope face, placement of topsoil on slopes, frequency of inspection and testing by the geotechnical engineer.
- Wet Weather Earthwork – imported fill materials for work in wet weather, on-site treatment of existing soils for use in fill construction, limiting work areas during wet weather, sealing ground surface to limit moisture exposure, and frequency of observation of excavation and fill placement by geotechnical engineer.
- Excavating Conditions and Utility Trenches – shoring or side slope needs for excavations, backfill lift thicknesses, and frequency of inspection and testing by the geotechnical engineer.
- Erosion Control Considerations – observation of soil types and their erosion potential, recommended methods to minimize erosion during construction.
- Foundations recommendations for specific lots, groundwater recommendations for specific lots, footing and wall drain recommendations, and seismic design recommendations.

e. Retaining Walls

Retaining walls greater than four feet in height shall have a professional engineer or geotechnical engineer registered in the State of Oregon provide stamped design

calculations and detail drawings required for the retaining wall construction. The wall design shall take into consideration the proposed grading in front of the wall, the proposed slope behind the wall, the wall drainage system, and the required setbacks for any proposed structures near the wall.

Retaining wall detail drawings shall be provided as part of the wall design and shall include at a minimum; wall profile, the degree of wall batter, wall cross section at the highest point of the wall, wall reinforcing geotextile requirements, wall drainage systems, and wall backfill requirements.

Refer to *Municipal Code Sections 16.42.060.D and 16.50.100* regarding retaining walls, and terracing.

Fences may be required on walls 30" or higher.

f. Lot Drainage Design

Weep holes through the curb are not allowed in the City of Happy Valley.

For those lots that are located on the downhill side of the street, care must be taken with the design of the storm sewer system. If the roof and foundation drain for the proposed structure cannot be taken by gravity to the storm sewer system in the street, an additional storm system shall be placed at the rear of the lots to catch this storm water. The storm system at the back of the lots shall be placed in an easement in accordance with Water Environment Services requirements.

It may be necessary to install french drains along the development boundaries to protect the downhill properties from surface water impacts caused by the development improvements.

4. Utility Installations

a. All utilities associated with or adjacent to a subdivision, PUD, multi-family, land partition or nonresidential construction project, shall be place underground.

b. Utility lines, vaults and pedestals shall be placed in the 8' Public Utility Easement (PUE) behind the right-of-way, and shall be joint trench whenever possible. An approved right-of-way permit is required for all installations.

c. On all phased (interim) road improvements, the necessary utilities shall be stubbed across the interim improvement to assure cuts are not necessary when the road is expanded to its full width.

d. Underground utilities being constructed along existing paved streets shall not be located under the existing pavement unless approved by the City Engineer.

e. The minimum depth of utilities on improved roads shall be thirty (30) inches as measured from finished grade to top of utility. On unimproved roads, the minimum depth shall be forty (40) inches.

f. Service crossings shall maintain the same depth as the main pipeline or buried cable to a point two feet behind the curb or center of the road or ditch. In no case shall there be less than one foot of cover from the bottom of the curb or ditch to the top of the service line.

g. Utility maintenance work or new facility installations that will be installed under the pavement in existing right-of-ways must be bored rather than open cut. Utility vaults shall be placed outside of the pavement limits.

h. Street crossings shall be installed at a 90-degree angle to the public right-of-way.

i. Any bore pits that are required in the pavement for connection purposes must be T-cut in accordance with the *City's Standard Drawing 200*. All excavations within the public right-of-way shall be backfilled with crushed rock in accordance with the *City's Standard Drawing 205*. Excavations in collector streets or arterials shall be backfilled with Control Density Fill (CDF) in accordance with the *City's Standard Drawing 210*.

j. The extent of the pavement repair shall be determined by the City Engineer on a case by case basis. For example, if the utility excavation is within 3 feet of the existing edge of pavement or within 5 feet of an existing trench patch, the pavement removal and

replacement will need to be extended to include these areas. Adjacent areas of existing pavement distress will also need to be removed and replaced as determined by the City Engineer.

k. If utility work requires the removal of an existing sidewalk or driveway, the affected concrete panels will need to be replaced in their entirety.

l. Utility work is not allowed on weekends. In the event of an emergency, a testing firm must be present during backfilling operations to confirm that compaction of the backfill was performed in accordance with City specifications.

5. Survey

a. General

This Manual, Section 105 of the APWA specifications and ORS 209.140-150, define the requirements for protection of existing survey monuments during any construction and setting new survey monuments following construction.

b. Plats

The City Engineer will not approve or sign any partition, subdivision or planned unit development (PUD) plat until the necessary public infrastructure to serve the proposed and affected existing lots has been installed. If the project is at least 80% complete and the incomplete work has been guaranteed by a security acceptable to the City for 125% of the value of the work, the plat may be signed, but building permits will not be issued until the public infrastructure has been installed and accepted by the City.

c. Existing Survey Monuments

Whenever an existing section corner, one quarter section corner, or donation land claim corner monument or accessory appears to be in danger of damage or destruction by any construction, the County Surveyor shall be notified in writing, not less than 10 working days prior to construction. The County Surveyor shall be reimbursed for all expenses from said replacement by the party responsible for the construction.

In accordance with ORS 209.150, any person or public agency removing, disturbing or destroying any survey monument of record in the office of the County Surveyor shall cause a registered Professional Land Surveyor to file a reference with the County Surveyor and replace the monument with 90 days of the removal, disturbance, or destruction. Failure to comply with this provision is subject to penalty according to ORS 209.990.

d. New Survey Monuments

Street Centerline Monumentation shall be in accordance with ORS 92.060 Subsection (2) and/or 209.15 Section 2. The centerlines of all street right-of-way shall be monumented before the City will accept a street improvement project. Monuments shall be set under the direction of a registered Professional Land Surveyor. A record of survey must then be filed in compliance with ORS 209.250 and any additional requirements set forth by the City.

All centerline monuments shall be placed in a monument box conforming to City standards and the top of the box shall be set at design finished grade. Monument boxes shall be of a type approved by the City before installation in accordance with the *City's Standard Drawing 170* for Monument Boxes.

The following centerline monuments shall be set:

(a.)At centerline intersections created with existing streets or new streets.

(b.) The centers of all cul-de-sacs.

(c.) Curve points in accordance with ORS 92.06 and 209.15.

All underground utilities shall be placed in positions that do not interfere with Centerline Monumentation.

6. Easements

An 8 foot wide Public Utility Easement (PUE) shall be granted along all proposed and existing street frontages in new developments.

The developer shall furnish all necessary utility easements in accordance with each utility company's requirements. Water easements are under the jurisdiction of the Sunrise Water Authority or Clackamas River Water. Storm and sanitary sewer easements are under the jurisdiction of Water Environment Services of Clackamas County.

Site distance easements shall be encompassed in a separate open space tract. See *Chapter 3, Section 4b* for more information.

7. Environmental Considerations

Section under Construction: in-water work, wetland delineations, Corp/DSL permits, nesting birds will be covered under this section.

8. Permits

The following permits must be obtained prior to beginning project construction:

a. Tree Removal Permit - A Type B Permit is required when trees are to be removed in conjunction with a subdivision, PUD, land partition or nonresidential construction project. The Type B Tree Removal Application is available on the City's website or at City Hall. The Tree Removal Application must be reviewed and approved by City staff prior to the issuance of a permit and removal of trees.

b. Site Development Permit – The Site Development Permit application provides the City with specific details about the development project. The permit is available on the City's website or at City Hall.

c. Right-of-Way Permit – The Right-Of-Way permit allows for the installation of improvements or utilities within the existing or proposed public right-of-way. The Right-

Of-Way permit is available on the City's website or at City Hall. The Right-Of-Way permit must be reviewed and approved by City staff prior to the issuance of a permit and construction.

d. NPDES 1200-C Permit – The NPDES 1200-C Permit must be obtained from DEQ if the disturbed area on a project is over one acre. Provide the City with a copy of the approved 1200-C permit.

9. Pavement Moratoriums

The City does not allow street cuts in an arterial or collector street that have been paved or resurfaced within the previous 5 years, or in other streets that have been paved or resurfaced within the previous 3 years.

CHAPTER 3
STREET DESIGN

1. General Requirements

a. Functional Classification

The functional classifications of existing and proposed streets in Happy Valley are established by the City's *Transportation System Plan* (TSP). The street cross section for each functional classification is set in the TSP, specifying the street width, right-of-way width, public utility easement width, number of travel lanes, the planter strip and sidewalk configuration, and bike lane requirements. *City Standard Drawing Nos. 100 thru 145* reflect the TSP cross section requirements.

b. Access Management

Access spacing standards are defined in the City's TSP. New development and roadway projects located on City street facilities shall meet the access spacing standards within the TSP. Access points include public streets, private streets, and private commercial or residential driveways.

The distance between access points is measured from the centerline of the subject street to the centerline of the adjacent street. The City Engineer shall have the authority to limit access and designate access locations on public streets under the jurisdiction of the City.

c. Structural Pavement Sections

Subgrade evaluation and recommendations shall be prepared by a Professional Engineer registered in the State of Oregon whose area of expertise is geotechnical engineering and shall be summarized in a Geotechnical Report. The Geotechnical Report shall address subgrade drainage and groundwater considerations for year-round conditions. Recommendations for both dry-weather and wet-weather construction shall be included.

The minimum design life for City streets is 25 years. *City Standard Drawing No. 160* outlines the minimum pavement sections used in Happy Valley for each functional classification. Projected traffic loadings or poor soil conditions may require a special pavement design section. *Asphalt pavement shall be designed using nationally recognized procedures; the AASHTO method or the Asphalt Institute method*.

Aggregate base shall meet ODOT Specifications Section 00641 for dense-graded base aggregate. Base rock shall be compacted in accordance with ODOT Specifications.

Hot mix asphalt concrete (HMAC) pavement shall be designed and constructed in accordance with ODOT Specifications Section 00745.

The top lift of asphalt concrete pavement shall be placed prior to the acceptance of the project.

d. Design Speed

Design speed shall be as follows:

Arterials	35 miles per hour
Collectors	35 miles per hour
Neighborhood	25 miles per hour
Local Residential	25 miles per hour

e. Subsurface Drainage

i. Subsurface street drainage shall be an integral part of street design. Subsurface drains shall be designed and constructed to properly address the affected soil.

ii. In the event that no subsurface drainage is required based on a soils report, a transverse perforated drain pipe shall be installed below the sub-base rock at the point of each sag vertical curve.

iii. The subsurface drains are for the purpose of collecting and conveying subsurface water only, not surface runoff. They are not to be considered part of the storm drainage system for storm drainpipe sizing purposes.

iv. Subsurface drains shall connect and drain into the storm drainage system at catch basins, curb inlets, gutter inlets, manholes or roadside ditches. Surcharge from the storm drainage system shall not be allowed to back up into the subsurface drains.

v. Alternative subsurface drainage measures may be used if approved by the City Engineer.

f. Guardrails. The following specifies the minimum requirements for the location and type of guardrails:

i. The decision of whether to install a guardrail or not shall be based on information found in the AASHTO publication, "Guide for Selecting, Locating and Designing Traffic Barriers".

ii. Guardrails shall be designed and constructed per ODOT's Standard Drawings for Design and Construction.

2. Horizontal Street Alignment

a. The layout of streets shall provide for the continuation of streets existing in adjoining partitions, subdivisions or planned unit developments or of their project alignments when adjoining property is not subdivided or partitioned.

b. The centerline alignment of street improvements shall be identical with the centerline of the right-of-way. The centerline of a proposed street extension shall be aligned with the existing street centerline.

c. Curb line radii shall be concentric with the right-of-way line except in cul-de-sacs and eyebrows.

d. Horizontal curves shall meet the minimum radius requirements set by AASHTO *A Policy on Geometric Design of Highways and Streets,* latest addition, except as noted in *c.* below.

e. The minimum centerline radius for street curves shall be as follows:

Arterials	Three hundred (300) feet
Collectors	Two hundred (200) feet
Neighborhood	One hundred (100) feet
Local Residential	One hundred (100) feet

f. The length of the roadway transitions from a wider width to a narrower width shall be based upon the following:

$$L = \frac{WS^2}{60} \quad \text{for speeds less than 45 MPH}$$

Where L = minimum taper length (ft)
S = design speed (MPH)
W = offset (shift) width (ft)

Within bike lanes or shoulders, roadway width transitions shall have a minimum 10 (length) to 1 (offset) taper.

g. Roadway width transitions from a narrower width to a wider width shall be designed with a three to one taper.

h. Delineators, as approved by the City Engineer, may be installed to define the roadway width configuration. Maximum spacing of delineators shall be the numerical value of the design speed, in feet, i.e., thirty-five (35) foot spacing for thirty-five (35) mph.

i. In situations where a tapered transition cannot be provided, a barricade shall be installed at the end of the wider section of the street and a taper shall be appointed and delineated as approved by the City Engineer. If the wider section does not provide an additional travel lane, only a barricade is required without the transition.

3. Vertical Street Alignment

a. The construction plans shall include a design profile for all streets within the project. The profile shall conform to *Section 2c of Chapter 2*.

b. Minimum tangent street gradients shall be 1% along the crown and gutterline.

c. Maximum street gradients shall be 8% for arterial and collector streets, and 10% for neighborhood and local residential streets. Grades in excess of 10% but not more than 12% may be permitted on local residential for short distances and must be approved by the City Engineer on an individual basis.

d. Intersection landings shall conform to *Section 4d* of this Chapter.

e. Grade changes of more than 1% shall be accomplished with vertical curves.

f. At street intersections, the crown of the major (higher classification) street shall continue through the intersection. The roadway section of the minor street will flatten to match the longitudinal grade of the major street at the projected curb line.

g. Street grades, intersections, and super elevation transitions shall be designed to not allow concentrations of storm water to flow across the travel lanes.

h. Shed sections and offset crowns may be allowed and must be approved by the City Engineer on an individual basis.

i. Slope easements shall be dedicated or obtained for the purposes of grading outside of the right-of-way.

j. Vertical curves shall be parabolic and conform to the values in Table 3-1 and are calculated as shown below:

$$K = \frac{L}{A}$$

Where A = algebraic difference in grades (percent)
L = length of vertical curve (feet)

Table 3-1

Design Controls for Stopping Sight Distance for Crest and Sag Vertical Curves

Design Speed (MPH)	K-Crest	K-Speed
15	3	10
20	7	17
25	12	26
30	19	37
35	29	49
40	44	64
45	61	79
50	84	96
55	114	115

K-values based upon AASHTO *A Policy on Geometric Design of Highways and Streets,* latest addition

NOTE: K-sag values may be reduced if street lighting is present. AASHTO publication, *Policy on Geometric Design of Highways and Streets,* latest addition, shall serve as a guide

k. Streets intersected by streets not constructed to full urban standards shall be designed to match both present and future vertical alignments of the intersecting street. The requirements of this manual shall be met for both present and future conditions.

4. Intersections

An intersection is defined as being the meeting of two streets having at least three legs.

a. The interior angle at intersecting streets shall be 90 degrees. Where intersecting streets cannot be kept at right angles due to existing development or topography, the interior angle shall not be less than 75 degrees. A tangent section shall be carried a minimum of 25 feet each side of intersecting right-of-way lines.

b. Sight distance at intersections shall meet the minimum requirements for intersection sight distance set by AASHTO *A Policy of Geometric Design of Highways and Streets*, latest edition, based upon the design speed. When a sight distance easement is needed at an intersection, an open space tract shall be dedicated to obtain the correct sight visibility. Plantings or structures in the open space tract/sight distance easement shall conform to *Section 4c* of this Chapter.

c. A clear vision zone shall be provided at all intersections as shown in Figure 3-1 below:

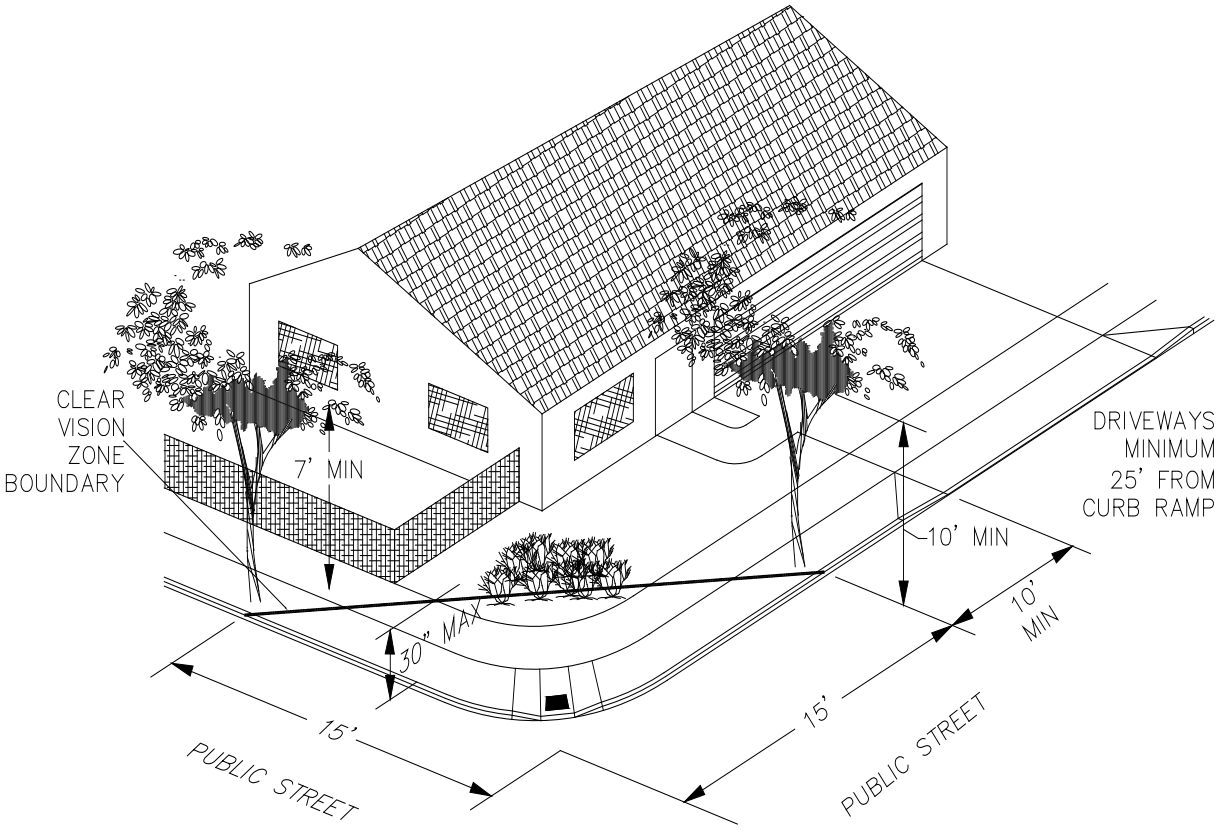

Figure 3-1
Clear Vision Zone

No fence, berm, wall, vehicle, hedge or other planting or structure shall be placed within the clear vision zone that would impede visibility between the height of 30 inches and 10 feet as measured from the top of curb, or in the absence of curb, from the established street centerline elevation. Poles, tree trunks, and similar objects less than 12 inches in width may be allowed in the clear vision zone if they meet the vertical requirements noted above and shown in Figure 3-1.

d. At intersections, a landing shall be provided on the secondary or subordinate approach, or on a stop-controlled approach. The landing shall have a slope averaging 5% or less for 50 feet. Landings are that portion of the traveled street that extend 50 feet beyond the projected curb line of the intersection street at full improvement.

e. Curb corners shall be designed so that the grade shall flow smoothly from one street to the other with proper attention directed to drainage.

f. Sidewalk curb ramps conforming to the *Americans with Disabilities Act (ADA) Standards for Accessible Design* shall be provided at all corners of all intersections where crossing is permitted, regardless of curb type, and shall conform to *Section 11* of this Chapter and *City Standard Drawing No. 245.*

g. Curb radii at intersections shall be as shown in Table 3-2 for the various function classifications with exceptions subject to approval by the City's authorized representative. The right-of-way radii at intersections shall be sufficient to maintain at least the same right-of-way to curb spacing as the lower classified street.

Table 3-2

Minimum Turning Radii (feet)

Minimum radius along edge of pavement or curb

Functional Classification	Major Arterial	Minor Arterial	Collector	Neighborhood	Local
Major Arterial	35	35	30	25	25
Minor Arterial		35	30	25	25
Collector			25	25	25
Neighborhood				25	25
Local					25

If a bike lane or on-street parking exists, above radii may be reduced by five feet

5. Cul-de-sacs, Eyebrows, Loop Turnarounds

The following specifies the minimum requirements for cul-de-sacs, eyebrows and loop turnaround areas. Other turnaround geometrics may be used when conditions warrant and when the City Engineer and Clackamas County Fire District #1 approve the design and application of its use.

a. Cul-de-sacs, eyebrows and other turnaround areas shall be allowed only on local residential streets and commercial/industrial streets. Cul-de-sacs shall not be more than 800 feet in length. The length of the cul-de-sac is measured along the centerline of

the roadway from the nearside right-of-way of the nearest through traffic intersection street to the farthest point of the cul-de-sac right-of-way.

b. The maximum grade in a turnaround or eyebrow shall be 5%.

c. The minimum curb radius for the cul-de-sac bulb shall be 45 feet. The right-of-way radius shall be sufficient to maintain the same right-of-way to curb spacing as in the adjacent portion of the road.

d. Cul-de-sac and other turnaround areas shall have an 8-foot public utility easement extending outside the right-of-way around the cul-de-sac, continuously.

e. The minimum curb radius for transition into cul-de-sac bulbs shall be 25 feet. The right-of-way radius shall be sufficient to maintain the same right-of-way to curb spacing as in the adjacent portion of the road.

f. An eyebrow corner may be used on a local street where expected average daily traffic (ADT) counts will not exceed 500 vehicles.

6. Stub Streets and Half Streets

a. Stub streets allow for future street extensions. A temporary all weather turn-around shall be provided at the end of stub streets that exceed 150 feet in length. The turnaround shall be built to Clackamas County Fire District #1 standards. Barricades shall be placed at the end of all stub streets in accordance with *City Standard Drawing 310*.

b. Half street designs require cross section data that illustrates the elevations at street centerline, sawcut line, and gutter line at 25 feet on center. Stations, offsets and cross slopes shall be shown on the plans.

c. The minimum paved width for frontage improvements shall be ¾'s of the functional classification's paved width.

d. Cross slope grade breaks created by the new gutter line shall be provided for half street improvements. The maximum grade break between the existing and proposed cross slopes shall be 2%.

e. The minimum cross slope on the new half street shall be 1%.

f. Cross sections shall be provided through existing driveways.

7. Private Streets

a. Private streets within single-family residential developments shall be designed to provide access to no more than five dwelling units.

b. Private streets serving attached housing and multifamily housing developments shall provide commercial drives in conformance with *City Standard Drawing No. 275 or 280*.

c. The pavement section shall be capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds in accordance with the standards set by Clackamas County Fire District #1 development codes.

d. The paved width, unobstructed clear zones and structural roadway section for private streets shall be in accordance with *City Standard Drawing No. 120*.

e. The maximum grade for private streets shall be 12%.

f. Where existing grades are such that private streets must exceed 12% to provide access to a site, the developer shall submit a request for a variance to the City and CCFD #1 for review and approval.

8. Raised Medians

a. The raised median shall be set back at least two feet from the median lane on both sides.

b. Raised medians within a cul-de-sac bulb shall require mountable curb and gutters on the outside of the radius for emergency vehicles.

c. Street lighting shall be sufficient to provide illumination of the raised median.

d. Objects, such as trees, shrubs, signs, light poles, etc., shall not physically or visually interfere with vehicle or pedestrian traffic in the travel-way.

e. The style and design of the raised median shall be site specific. The raised median designs and landscaping shall be subject to Planning Commission approval.

9. Curb and Sidewalks

a. Curb and gutter shall be provided with sidewalks on both sides for all road classifications. The minimum grade for curb and gutter shall be 1%.

b. Sidewalks shall be separated from the curb as indicated in the TSP and standard details. The maximum sidewalk slope shall be 15%.

c. Sidewalk Trip Hazard – A sidewalk trip hazard exists if there is a vertical height difference between adjacent sidewalk panel sections. If the sidewalk is raised more than ½" and less than 1", the concrete may be ground to remove the trip hazard in accordance with *City Standard Drawing 255.* If the sidewalk is raised more than 1", one complete panel at a minimum shall be removed and replaced to eliminate the trip hazard.

10. Driveways

a. Driveways shall conform to City Standard Drawings. Curb removal for driveways shall be by sawcutting.

b. All driveways shall be paved with asphalt or concrete. An exception may be made for long rural driveways, as long as the first fifty feet of driveway from the public road is paved.

c. Driveway access spacing shall be in accordance with the TSP.

d. Driveways shall meet the minimum intersection sight distance requirements.

e. Concentrated surface runoff shall not be allowed to flow over commercial driveways or sidewalks into the street.

f. The maximum grade for all driveways is 12 percent.

g. The maximum width of a driveway throat shall be 35 feet as shown on *City Standard Drawing 270*.

11. Typical Cross Sections

Grading outside the improved areas shall be 2 percent upward to the right-of-way line, 5:1 upward or downward within the public utility easement and no steeper than 2:1 up or down outside the public utility easement.

Retaining walls shall be used if slopes are greater than the 2:1 requirement in the paragraph above. Retaining walls shall be constructed to a height where the slope above the wall is no more than 2:1.

Cross-slope of streets shall be not less than two percent or greater than five percent. Wherever practicable, the crown of the street and top of curb shall have the same elevation.

12. Planter Strip

The planter strip landscaping and street trees shall conform to *Municipal Code Section 16.42.040.* A landscape plan for the planter strip landscaping and street trees shall be included the construction plan set as noted in *Section 2a of Chapter 2*.

13. Curb Returns/ADA Accessibility

Because of the topography in Happy Valley, an individual curb return design shall be included in the plan set for each curb return. Provide a profile of the curb return that extends 50 feet beyond the PC/PT of the curb return. Provide a plan view of each curb

return with spot elevations at the PC/PT, landing, and ramps. The landing shall have a maximum of 2% slope in all directions.

The maximum grade on the ADA ramps is 8.33%. The minimum grade is 1%. All grades shall slope toward the street. Yellow truncated domes are to be installed in the throat of the ADA ramp.

Curb ramps shall conform to *City Standard Drawing No. 245*.

14. Catch Basins

Streets with bike lanes shall have curb inlets so that there is no grate located in the bike lane. Catch basins shall be spaced no more than 250 feet apart.

CHAPTER 4
SITE IMPROVEMENT PLANS

1. General

Site Improvement Plans for commercial, industrial, and multifamily developments are reviewed by the Engineering Division. Site Improvement Plans shall be designed and stamped by a professional engineer, registered in the State of Oregon, herein after referred to as the Design Engineer. These projects are generally conditioned through the development review and land use approval process. *Chapter 2* of the *Engineering Design Manual* provides drawing requirements for the Site Improvement Construction Plans.

2. Grading and Erosion Sediment Control

The Engineering Division reviews the site grading and erosion sediment control plans for commercial, industrial, and multifamily developments. *Chapter 2, Section 4* provides the requirements for the grading and erosion sediment control design.

3. Retaining Walls

Retaining walls greater than four feet in height shall have a professional engineer or geotechnical engineer registered in the State of Oregon provide stamped design calculations and detail drawings required for the retaining wall construction. See *Chapter 2, Section 3e* for retaining wall design guidelines.

4. Parking Areas - The goal of site design in Happy Valley is to provide for the safe movement of all vehicles, pedestrians and service providers. All parking areas shall be hard surfaced. Concentrated surface runoff will not be allowed to flow over commercial driveways or sidewalks into the public street. The parking lot design shall be in accordance with *Municipal Code Section 16.43.030*.

a. Parking Lot Layout

Minimum AASHTO sight distance requirements shall be met at all streets and internal site intersections and driveways.

The developer's engineer shall provide the City with a site plan exhibit showing the expected routes and turning patterns for emergency vehicles, garbage trucks, and delivery/moving trucks interior to the site. The site plan exhibit shall be separate from the construction drawings.

The fire turnaround locations and dimensions shall be superimposed on the Site Improvement Plan in the construction plan set.

b. Heavy Pavement Section

The route through the parking lot for emergency vehicles, garbage trucks, and delivery/moving trucks interior to the site shall have a pavement section capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds in accordance with the standards set by Clackamas County Fire District # 1. The City's standard pavement section for residential streets will meet this requirement.

c. Signage and Striping - Provide a parking lot signage and striping plan for review. See *Municipal Code Section 16.43.030* for more information.

d. Lighting – Adequate lighting shall be provided on all private access roads and parking lots in accordance with *Municipal Code Section 16.43.030.F.6*.

e. Landscaping – Provide a site landscape plan for review.

5. ADA Standards – All current ADA requirements for parking lots, streets and intersections shall be met. The site layout will be reviewed for conformance to the *Americans with Disabilities Act (ADA) Standards for Accessible Design*.

a. Accessible Route – Provide spot elevations along the accessible route for City review. Provide an accessible route from the public way to the building.

b. Curb Ramps – Truncated domes are to be provided in the throat of all curb ramps.

c. ADA Parking Spaces – See *City Standard Drawing No. 335* for a detail of the Accessible Parking Area Stencil.

CHAPTER 5
CONSTRUCTION

1. Pre-Construction Meeting

Prior to beginning construction, the contractor shall attend a pre-construction meeting with City staff. See *Chapter 1, Section 6* for more information. Any contractor performing work in the City of Happy Valley will need a Happy Valley Business License.

2. Work Hours

The hours of work are closely monitored by the City throughout the construction of a project. A Construction Hours Sign shall be installed at every construction site. The sign shall be in accordance with the *City's Standard Drawing 350* and as shown below:

SITE CONSTRUCTION SHALL BE LIMITED TO
7:00 AM TO 6:00 PM ON WEEKDAYS, AND
8:00 AM TO 5:00 PM ON SATURDAYS AND SUNDAYS.

HOWEVER, SITE CLEARING, EARTH MOVING, INSTALLATION OR CONSTRUCTION OF UNDERGROUND UTILITES, PAVING OF STREETS AND SIDEWALKS, FOUNDATION FRAMING AND POURING, AND STRUCTURAL FRAMING SHALL BE ENTIRELY PROHIBITED ON SUNDAYS.

TO REPORT VIOLATIONS CALL 503-783-3800.

The City Manager or the Director of Community Services may allow longer, or require shorter, work hours depending on site-specific conditions. The following holidays will be considered as Sundays: New Year's Day, Independence Day, Thanksgiving Day, and Christmas Day.

In order to perform work covered by the Site Development Permit outside the above days and hours; the owner, developer, or Engineer of Record (or contractor if accompanied by a written authorization by Developer) shall submit a request in writing at least two full business days prior to the requested day. This request shall indicate what special circumstance requires the work to be performed outside the standard work week as described above. To be valid, the City Manager or the Director of Community Services approval must be in writing and this approval shall be available at the site on the approved work day, and a copy of it shall be submitted with the Engineer of Record's daily report to the City Engineer. Requests made with less than two days' notice may not be approved if the City Manager or Director of Community Services is not available.

3. Safety and Traffic Control

The contractor is responsible for the safety of the work zone and of all persons and property coming into contact with the work. The contractor shall comply with all requirements prescribed by OSHA. Work zone traffic control shall conform to the most recent edition of the *MUTCD*. At the City's discretion, a traffic control plan shall be submitted and approved prior to construction.

Temporary traffic control signs and barricades should not be located on sidewalks or in bike lanes.

The role of the City Inspector is not one of supervision, safety management or enforcement of OSHA's rules, but is one of observation only. The City Inspector may point out possible OSHA violations to the contractor, but must rely on OSHA for determining and enforcing violations.

4. Construction Inspection

The City shall be provided access to inspect all improvements required under a permit or land use decision. The costs for roadway inspection, plan review, and project coordination are assessed and included in the issuance of the Site Development Permit and/or Right-of-Way Permit fee.

All public improvements shall be inspected by an Inspecting Engineer who is an Oregon registered Professional Engineer or a qualified individual under the supervision of an Oregon registered Professional Engineer as required in the Engineering Services Agreement (Appendix A).

Inspecting Engineering firms, and all employees of such firms, shall not have a partnership, or any form of real property interest, in the development for which the improvements are required. The Inspecting Engineer's relationship to the project must be solely that of a professional service nature.

The City does not provide full inspection services for non-public funded public improvements.

a. City Inspection Activities

An inspector from the City will be assigned to each project to provide only "spot check" (secondary) inspection services, which are listed below. Such inspection may extend to any or all parts of the work and to the preparation and/or manufacture of the materials to be used.

The inspector is not authorized to:

i. Revise, alter, or relax the provisions of the specifications, the approved plans, or these Standards.
ii. Direct how the work is to be performed.

The inspector has the authority to:

i. Act as a liaison between the Inspecting Engineer and the City.
ii. Monitor work progress and materials furnished, including without limitation; the preparation, fabrication, or manufacture of materials to be used.
iii. Perform administrative and coordination activities as required to support the processing and completion of the project.
iv. Require revisions to approved engineering plans when necessary due to conflicting field conditions.

v. Temporarily suspend the work for safety deficiencies and allow work to proceed after safety deficiencies have been corrected.
vi. Exercise additional delegated authority.

The City inspector shall be present at the following inspections:

i. Verification of the Construction Hours Sign installation.
ii. Verification of the initial placement of Erosion and Sediment Control facilities. No work will begin until the site erosion control has been inspected and approved by the City.
iii. Proof roll of base rock prior to curb placement and paving.
iv. Inspection of concrete forms for curb returns and ADA facilities.
v. Placement and compaction of pavement.
vi. Striping layout.

b. Inspecting Engineer's Activities

Privately funded inspection services required by the City are the primary inspection services on a project, are more comprehensive and intensive that City inspection services, and are the responsibility of the owner, developer, and designated inspecting engineer. The following minimum activities are required of the designated inspecting engineer:

i. *Execute the Engineering Services Agreement accepting responsibility. (Appendix A)
ii. Maintain daily inspection reports which contain the following information:
    a. Job number and name of Engineer and designees
    b. Site development permit number
    c. Date and time (arrival and departure) of site visits
    d. Weather condition, including temperature
    e. A description of construction activities
    f. Statements of directions to change plans, specifications, stop work, reject materials, or other work quality actions
    g. Public agency contacts which result in plan changes or other significant actions

h. Perceived problems and action taken
i. Final and staged inspections
j. Record all material and soil types and conditions
k. Test results
l. Record all pavement grade and depth measurements by street stationing
m. General remarks including citizen contact or complaints
n. Maintain ESC daily log book and ESC inspection reports

All active site development projects will be required to turn in daily inspection reports to the City on a weekly basis containing information as outlined above. If the compiled reports become more than two weeks in arrears, or are significantly deficient as determined by the City Engineer, a stop work order may be posted on the project site.

iii. Obtain and use a copy of the City-approved construction plans, specifications, and a copy of this manual.
iv. Review and approve all pipe, aggregate, portland cement concrete, asphaltic concrete, and other materials to ensure their compliance with City standard.
v. *Approve all plan or specification changes in writing and obtain City approval. All changes to the approved plans or specifications must be with the approval of the City prior to the commencement of work affected by the revision.
vi. Monitor construction activities to ensure end products meet City specifications.
vii. *Perform (or have performed) material, composition, and other tests required to ensure City specifications are met.
viii. For street construction, perform the following inspections and record date of each:
    a. Curbs, curb and gutter, catch basins and street inlets, and sidewalk ramps are built to line and grade and meet all ADA requirements.
    b. Subgrade meets grade and compaction specifications.
    c. Base rock meets depth/thickness, gradation, grade, and compaction specifications.
    d. Leveling course meets depth/thickness, gradation, grade, surface condition, and compaction specifications.

e. Wearing course meets material, depth/thickness, gradation, grade, surface condition, and compaction specifications.
f. Provide the City with 24-hour notice of impending inspections.

ix. For grading, ensure that the grading plan, as staked, will result in acceptable slopes along exterior property lines, proper on and offsite drainage, and erosion control.

x. Prior to requesting any building occupancy on commercial, multi-family, and/or other projects with concurrent site development and building permits, the engineer shall certify that all necessary public improvements have been installed and accepted in compliance with the City approved Site Development Permit construction plans. This certification shall also indicate that all items required (at or before occupancy of the first building) through the land use process, have been completed (including but not limited to payment of all fees, recording of all public utility easements, and obtaining maintenance bonds).

xi. Call to the City's attention within two working days all plan changes, material changes, stop work orders or errors or omissions in the approved plans or specifications.

xii. Notify the City 24-hours before the start of construction or resumption of work after shutdowns, except for normal resumption of work following Sundays or holidays.

*The inspecting Engineer of record must personally perform all activities marked by an (*) and must supervise all individuals performing delegated activities. Material testing not performed by the inspecting Engineer must be accomplished by a recognized testing firm or another registered engineer.

c. Inspection Notification

A minimum of 24-hours' notification shall be given to the City when the following work is to be scheduled:

i. Initial placement of erosion and sedimentation controls.
ii. Proof roll of base rock prior to curb placement and paving.
iii. Concrete form inspection of curb returns and ADA facilities.

iv. Placement and compaction of pavement.
v. Striping layout.

d. Testing

All testing required by the City shall be at the applicant's expense.

5. Erosion and Sediment Control

The City of Happy Valley has adopted the Water Environment Services (WES) Erosion Prevention and Sediment Control Planning and Design Manual (latest version) as the standard for erosion and sediment control design and construction requirements. All fencing, erosion and sediment control facilities and construction entrances shall be installed and inspected by the City prior to beginning any work on the site.

Vegetative cover shall be maintained on slopes or established through new plantings for stability and erosion control purposes. Vegetation shall not be stripped from any steeply sloped area except for construction of utilities, internal streets, parking areas, pedestrian facilities, retaining walls and buildings.

Wet weather measures shall be implemented and maintained between the dates of October 1st and April 30th. Sediment that is tracked off of a construction site and onto adjacent public streets will need to be removed immediately by mechanical means rather than washing with water.

Prior to project acceptance, the site vegetation must be established and/or final erosion control measures covering all exposed soils need to be in place.

6. Site Grading

The following areas will need to be fenced using the standard 4' orange construction fencing prior to construction:

- Grading limits
- Protective fencing around trees that will preserved - A tree removal permit must be obtained from the City prior to the removal of any trees on site in conformance with *Municipal Code Section 16.42.050*
- Conservation easement lines or environmentally sensitive areas

All construction trucking used for haul-off of excavated material shall perform transfer of trailers on-site. Surrounding City streets shall not be used as a staging area for dump trucks with trailers to perform transfers. Dust shall be controlled within the development during construction and shall not be permitted to drift onto adjacent properties. All construction sites shall be maintained in a clean and sanitary condition at all times. Construction debris, including food and drink waste, shall be restricted from leaving the construction site through the use of proper disposal containers or construction fencing enclosures. Failure to comply may result in a "Stop Work" order until deficiencies have been corrected to the satisfaction of the City. Noise shall be kept at the minimum level possible during construction. The developer and/or contractor shall agree to aggressively ensure that all vehicles working on the development shall have adequate and fully functioning sound suppression devices installed and maintained at all times.

7. Utility Installations

All utilities, including electrical power, telephone, cable TV, gas and others shall be under ground when associated with new public improvements and private development projects. See *Chapter 2, Section 4* for additional information.

8. Placement of Asphalt and Concrete

The City has adopted the APWA/ODOT *Oregon Standard Specifications for Construction*. The placement of asphalt and concrete shall be in accordance with these standards

9. Preservation, Restoration and Cleanup

The owner, developer and/or contractor shall preserve, protect and maintain existing site features beyond the construction limits.

10. Project Acceptance

The City will do a final inspection walk through of the project when all elements on the approved construction plans are complete and the final erosion and sediment control measures are in place. A project punchlist will be prepared outlining the items that need to be complete prior to project acceptance and submittal of building permits. See *Chapter 1, Section 7* for additional information.

Appendix A

Engineering Services

AGREEMENT

By this agreement, required by the City of Happy Valley, _____ _____ proposes to provide professional engineering, surveying, and inspection services for the proposed project, _____ _____ as follows:

1. Provide field surveying, engineering, design and drafting to prepare the necessary construction plans for the proposed project. Submit plans for approvals from the governing agencies.

2. Provide field construction layout for the street improvements, sanitary sewer system and storm sewer system.

3. Provide field inspection for the project as required, with billing to be on an hourly basis. The City of Happy Valley requires that inspection shall be provided continuously during construction. Inspectors shall be recognized as representatives of the Engineer and their duties shall be to approve materials and workmanship as required by the plans and specifications. The Engineer may give written notice that all work be stopped until the Engineer is satisfied that materials and workmanship conform to the applicable specifications.

4. Prepare “As-Builts” plans for the constructed street improvements, sanitary sewer system and storm sewer system, including a certificate of completion, and mylar copies of the improvement plans.

The fee for these services will be as outlined in the proposal dated _____ for engineering services.

Engineer _____ Dated _____

By _____

Owner _____ Dated _____

By _____